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A 'HUMAN NEEDS' DIET IN APRIL, 1951

It was to be expected that the cost of a 'human needs' diet would be somewhat higher in April 1951, than it had been in November 1950,[1] as small increases had since been made in the controlled prices of bread, flour, and certain other grain products. Moreover, the price of fish had risen, and there had been complaints of the high cost of vegetables, especially at the week-ends. Whether vegetable prices were higher, however, was disputed, and we therefore paid it particular attention in our April survey. We discovered no foundation for it as far as concerned the more common types of vegetables, such as old carrots, swedes, cabbage, and onions, in any of the districts and towns we visited.[2] Indeed, we found cabbage and onions to be generally cheaper in April 1951, than they had been in November 1950. There are, however, at present no fixed prices for vegetables, and it was possible for a housewife to pay a little more for her vegetables than the outlay scheduled by us (Table I); but there was no need to do so, unless she habitually made her purchases at the dearest greengrocers' of the district. In fact, vegetables could often be obtained at prices below those shown in Table I, though not, generally, everywhere.

In April 1951, the main problem for the housewife with a slender purse, in catering for her family, was the excessively small meat ration, which only gave her 10d. worth of meat per head per week. In November 1950, the ration had been 1s. 6d. worth. Furthermore, sausages, of which there had been a good supply in November, were almost unobtainable in April. Unrationed meat products of the tinned varieties were very dear, and hence cannot be considered adequate substitutes for butcher's meat in the dietary of a family whose income allows for nothing more than the satisfaction of bare 'human needs.' Herrings and kippers, on the other hand, were freely available and relatively cheap, and we included in our dietary 6 lb. of these per week for a family of 5 persons.[3] This appeared about the maximum amount that a family of this size could be reckoned to eat per week, unless one postulated a family inordinately fond of fish.

Our dietary assumed that all the members of the family have to be provided with all their meals by the housewife. A mother with three children

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[1] *Cf.* T. Schulz, *A ' Human Needs ' Diet in November*, 1950 ; BULLETIN, Vol. 13, No. 1.

[2] These were—beside Oxford—Banbury, Abingdon, Newbury, Henley-on-Thames, Reading, Slough, Uxbridge, and London. In London, our investigations were carried out in Paddington, Lambeth, and Bethnal Green.

[3] Husband, wife, and three children of school age.

TABLE I

Weekly 'Human Needs' Diet for a Family of 5 Persons

	Quantity	Price per Unit[1]	Changes since Nov. 1950 Quantity	Changes since Nov. 1950 *Cost*
		s. d.		*s. d.*
(*a*) Rationed Foods :				
1 Meat	2 ℔ 12 oz.	1 6[2]	—2 ℔ 4 oz.	*—3 4*
2 Bacon	1 ℔ 4 oz.	2 3	+ 5 oz.	+ *6½*
3 Margarine	2 ℔ 8 oz.	10	...	...
4 Cooking Fat	10 oz.	1 0	...	...
5 Sugar	3 ℔ 2 oz.	5	+ 10 oz.	+ *3¼*
6 Tea	8 oz.	3 4	...	— *2*
7 Cheese	10 oz.	1 2	...	...
8 Eggs	10 eggs	3½	+ 5 eggs	+*1 5½*
Cost of Group (*a*)		*16 3¾*		— *1 2¾*
(*b*) Fresh Milk :				
9*a* Ordinary Milk	20 pt.	5	+ 1½ pt.	+ *7½*
9*b* School Milk	5 pt.	free	...	...
Cost of group (*b*)		*8 4*		+ *7½*
(*c*) Main Carbohydrate Foods :				
10 Bread	20 ℔	3½[3]	...	+ *5¼*
11 Flour	2 ℔	4¼	...	+ *0½*
12 Potatoes	21 ℔	1¾[4]	...	+ *4½*
Cost of Group (*c*)		*9 5*		+ *10¼*
(*d*) Fresh Vegetables *excl. potatoes* :				
13*a* Carrots	3 ℔ 8 oz.	2½	...	...
13*b* Swedes	3 ℔ 8 oz.	2½	...	...
13*c* Cabbage	6 ℔ 8 oz.	4	...	— *3¼*
13*d* Onions	8 oz.	4	...	— *0½*
Cost of Group (*d*)		*3 9½*		— *3¾*
(*e*) Other Foods :				
14*a* Peas ...	12 oz.	11	+ 4 oz.	+ *3¼*
14*b* Beans	8 oz.	11	...	+ *1*
14*c* Lentils	4 oz.	1 0	— 4 oz.	— *1½*
15 Rolled Oats	2 ℔ 8 oz.	8	...	+ *2½*
16 Macaroni	1 ℔ 4 oz.	11	+ 1 ℔	+ *11½*
17 Semolina	1 ℔ 8 oz.	7	...	+ *1½*
18*a* Jam	6 oz.	1 3	...	+ *0¼*
18*b* Syrup	1 ℔	10[5]	+ 1 ℔	+ *10*
19 Rice ...	1 ℔ 8 oz.	10	+ 1 ℔	+ *10*
20 Cocoa	4 oz.	1 7½	...	+ *1½*
21 Condiments	...	1 0	...	...
22*a* Herrings	3 ℔ 8 oz.	10	+ 2 ℔ 8 oz.	+ *2 3*
22*b* Kippers	2 ℔ 8 oz.	1 2	...	+ *5*
23 Sausages	8 oz.	1 7	— 1 ℔ 4 oz.	— *1 7½*
24 Dried Fruit	1 ℔	1 0	...	+ *2*
Cost of Group (*e*)		*17 0¾*	...	+ *4 6½*
Total Cost		**54 11**		**+ 4 5¾**

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[1] The price unit is eggs, one egg; milk, one pint; cocoa, ½ ℔ packet; condiments, tota outlay; all other foods, one ℔.

[2] Average price of inexpensive cuts. [3] 1¾ ℔., 6d. [4] 7 ℔, 1s.

[5] Bought in 2-℔ containers.

TABLE II

Relative Cost and Nutritive Values of Foods in ' Human Needs ' Diet for 5 Persons (Table I)

Foods (Quantities given in Table I)	Cost %	Calories %	Protein %	Calcium %	Iron %	Vitamin A %	Vitamin B_1 %	Vitamin C %
1[1] Meat	7.6	3.4	6.8	0.4	7.9	0.4	2.2	—
23 Sausages	1.4	0.6	1.0	0.2	1.0	—	0.7	—
2 Bacon	5.1	3.0	1.6	0.2	1.2	—	4.2	—
22 Herrings and Kippers	10.7	4.2	10.9	5.5	5.8	2.0	0.4	—
8 Eggs	5.3	0.9	2.3	0.9	2.6	3.6	1.4	—
7 Cheese	1.3	1.4	2.6	7.0	0.4	2.6	0.2	—
9 Milk[2]	15.2	10.0	16.7	51.7	3.0	10.6	12.4	11.4
	46.6	23.5	41.9	65.9	21.9	19.2	21.5	11.4
3 Margarine	3.8	10.2	—	0.1	0.8	16.1	—	—
4 Cooking Fat ...	1.2	3.0	—	—	—	—	—	—
5 Sugar	2.4	6.3	—	—	—	—	—	—
25 Syrup	1.5	1.5	0.1	0.3	1.3	—	—	—
18 Jam	0.8	0.5	—	—	—	—	—	—
24 Dried Fruit	1.8	1.3	0.4	0.9	1.6	0.1	—	—
10 Bread	10.4	26.7	28.4	15.6	32.1	—	32.4	—
11 Flour	1.3	3.7	3.9	2.1	4.5	—	5.2	—
16 & 17 Macaroni and Semolina	3.7	4.9	4.9	0.8	3.1	—	2.0	—
19 Rice	2.3	2.8	1.6	0.1	0.5	—	1.0	—
15 Rolled Oats ...	3.0	5.2	5.0	2.1	9.6	—	9.8	—
14 Pulses	2.6	2.2	5.9	2.0	8.0	0.2	5.9	—
12 Potatoes	5.5	6.3	5.0	2.0	6.7	—	16.7	12.8
13*a* Carrots	1.3	0.3	0.4	1.9	1.1	60.0	1.5	4.3
13*b* Swedes	1.3	0.3	0.4	1.7	1.1	—	0.7	15.0
13*c* Cabbage	4.0	0.6	1.1	4.1	4.2	4.4	3.0	55.6
13*d* Onions	0.3	0.1	0.1	0.2	0.2	—	0.1	0.9
20 Cocoa	1.3	0.6	0.9	0.2	3.3	—	0.2	—
	48.5	76.5	58.1	34.1	78.1	80.8	78.5	88.6
Total	100.0[3]	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1] The serial numbers correspond to those in Table I.
[2] Including 5 pints received free by the 3 children at school.
[3] Including cost of tea and of condiments.

who has to find all her husband's meals on 7 days a week is unlikely to have much meat to spare for herself and the children out of a weekly family joint of 2¾ lb., though everyone may get a taste of meat on Sunday. Next to fish, the cheapest meat substitute, from a nutritional point of view, that was freely available, is milk. On the assumption that the family, and in particular the wife and the children, find milk puddings acceptable, and have them frequently, we have increased the weekly allowance of domestically consumed milk in our diet schedule from 18½ to 20 pints, and in conjunction with it, the allowances of sweet and of starchy foods. The April diet, which provides about the same nutritional intake as the November diet, cost 54s. 11d. per week, or 4s. 5¾d. more than the November diet, in spite of a slight decrease in the cost of vegetables and of tea. There was no decline in the price of tea, but we found that the cheaper varieties, at 3s. 4d. a lb., were generally available in April, and clearly exhibited in many shops, which had not been the case in the previous November.

On account of the inclusion of more cereals, sugar, and syrup, the calorific content of the April diet was slightly higher than that of the November diet, and the purchase of say, 1 lb. of macaroni and 1 lb. of syrup might on this count be considered superfluous. But it is unlikely that in all families 3 children who already receive 1 pint of milk between them on 5 days at school, would drink daily at least another 2 pints at home, unless part of it were served in some kind of disguise, such as milk puddings, for which a considerable amount of sweetening matter is indispensable. As we have shown in earlier papers in this series, the consumption of bread envisaged by us per child is not large; a marked reduction in the allowance of bread would therefore tend to yield a dietary which although apparently sufficient for the family as a whole, would yet leave the diets of the individual members unbalanced, or else would presume the consumption of highly unusual diets. A somewhat similar problem arises if we assume that the housewife purchases the family's sweets ration in lieu of some other foods. If the milk consumption remains unchanged and the sweets replace some of the sugary and starchy foods, no harm will be done to the children's diet. If, however, sweets are used as a substitute for pudding made with a generous amount of milk, after a ' main ' dish consisting essentially of vegetables, the loss of first-class protein, vitamins, and of calcium, could be serious. The cheapest boiled sweets cost about 2s. a lb. The total sweet ration for a family of 5 persons, amounting to 25 oz. per week, would thus require an outlay of 3s. 1½d. On the assumption that these sweets take the place of 1 lb. of syrup and 14 oz. of macaroni, the purchase of the full ration of sweets would raise the housewife's total outlay on food by 1s. 5¼d. per week.

The relative cost of the several items of the diet is compared with their relative nutritive importance in Table II. The first 7 groups show those foods that are sources of first-class protein; about half of this would derive from meat and fish and half from milk, cheese and eggs. In calculating the available content of vitamin A from the foods of the diet we have taken 3 International Units of the pro-vitamin carotene to be equivalent to 1 International Unit of vitamin A. The actual values of vitamin C of all the vegetables have been halved so as to allow for the losses of this unstable vitamin in the preparation, cooking, and serving of the dishes.

Table III gives the average nutritional requirements of each member of the family together with the intake available from the diet per Male Adult Equivalent (MAE) per day. The number of MAE represented by the family varies for the several nutrients, according to the individual requirements of each member for any of them. Thus while the husband's needs for calories are the greatest, the children have the highest requirements for calcium. For each nutrient we have equated the husband's requirements to 1 and then expressed the requirements of the other members of the families as fractions of this. For iron, *e.g.*, the MAE of the wife equals that of the husband, while

TABLE III

Nutritional Requirements and Intake from 'Human Needs' Diet

	Nutritional Requirements per Day				M.A.E.[2] of Fam. of 5 Persons	Intake from Diet per M.A.E per Day
	Husband	Wife	Children			
			7—12 years[1]	5 years		
Calories	3000	2500	2100	1500	3.73	3200
Protein, gm.	70	60	65	50	4.43	87
Calcium, gm.	0.8	0.8	1.4	1.3	7.13	0.7
Iron, mgm.	10	10	13	8	5.40	13
Vitamin A, Intern. Units... ...	3000	3000	3000	3000	5.00	4050
Vitamin B$_1$, mgm....	0.90	0.75	0.95	0.68	4.68	1.6
Vitamin C, mgm.	30	30	30	30	5.00	37

[1] 2 children in this age group.
[2] Male Adult Equivalent.

that of each of the two elder children is 1.3 and that of the youngest child 0.8, giving a total for the whole family of 5.3 MAE.

Largely owing to the fact that both milk and vegetables were freely available in April 1951 and relatively cheap, it was possible to purchase a diet for 5 persons at a weekly outlay at approximately 55s. But only a mother who had accustomed her family to a relatively high consumption of milk and who understood how to prepare with it a variety of simple and palatable dishes, was likely to be able to feed everyone in her family adequately at this outlay.

T. SCHULZ.

EARNINGS IN ENGINEERING, 1926–1948

I. INTRODUCTORY

In an earlier article,[1] in which we examined the development of the skill differential in several industries including engineering, we had to base the differentials on time-workers' wage rates. But wage studies based on time rates are somewhat unrealistic. Many workers are not paid by time, and those who are do not necessarily work the hours to which the rates refer and may also receive several other kinds of rate. The opportunities for supplementing income vary, even within categories which are rated as identical and from firm to firm.

Since the engineering industry is highly diverse in these respects, it seemed important to provide detailed data on actual earnings. The material on which this article is based[2] was originally compiled by the Engineering and Allied Employers' National Federation, who have very kindly put it at our disposal. We are most grateful to the Federation—and also to the Amalgamated Engineering Union and the Confederation of Shipbuilding and Engineering Unions—for their ready assistance, although of course none of these bodies can be held responsible for the way in which we have used the material. A brief description of the documents is given in the Appendix (which deals principally with the methods of compiling the tables). For 1948, the material covers more than four hundred thousand adult male workers employed by firms in the 48 regional Associations of the National Federation.

The principal sections of the present article are concerned with the skill differential, time-work and payment by results, hours, and regional differences. Each deals with the position in 1948, and then, briefly, with developments since 1926.

II. THE SKILL DIFFERENTIAL

In Table I we compare, for fitters and labourers in January 1948, skill differentials based both on time rates and on earnings. For the sake of comparability we give skill differentials based on rates on a ' new basis '—*i.e.* calculated in the same way as are the earnings figures; in fact, those on the ' old basis ' differ little from those on the ' new basis '. The earnings figures refer to all workers (*i.e.* payment by results workers as well as time-workers). The inadequacy of the convention of using relative time rates to indicate differences in workers' pay packets can be seen. The extent to which unskilled workers had caught up with the skilled was somewhat over-

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[1] *Differences between the Wages of Skilled and Unskilled Workers*, 1880–1950, BULLETIN, April, 1951.

[2] In an interesting article (*Payment by Results in British Engineering, International Labour Review*, June 1944) W. McLaine, Assistant General Secretary A.E.U., gives certain figures of earnings and hours for time-workers and payment-by-results workers in 1940 and 1941. We have however not made use of these, since we are not quite certain of the basis on which they are presented. While the figures of time-workers' and P. by R. workers' earnings and hours accord fairly well with our own material, the relative numbers of time-workers for weighting averages do not seem to be wholly consonant with our data.

TABLE I

Skill Differentials in Rates and Earnings at January 1948

	Average rates: old basis[1] (timeworkers)	Average rates: new basis[2] (time-workers)	Average earnings (time-workers and P. by R. workers together)
Fitter's weekly wage (shillings) ...	102.0	102.8	146.6
Labourer's weekly wage (shillings)	86.0	87.3	115.9
Skill differentials (per cent)[3] ...	*84.4*	*84.9*	*79.1*

[1] As in previous article (BULLETIN, April 1951). [2] See Appendix.

[3] *I.e.* labourer's wage as percentage of fitter's. Percentages, in this and other tables, were calculated from the original figures before rounding off.

TABLE II

Skill Differentials in Rates and Earnings and the Position of the Semi-Skilled, 1926–1948

Year and Month	*Skill differentials (unskilled as % of skilled)*[1]		*Semi-skilled as % of skilled*[1]
	rates[2] (time-workers)	earnings (time and P. by R. together)	earnings (time and P. by R. together)
1926 Oct.	71.4	68.3	N.A.
1928 Oct.[3]	72.4	68.5	N.A.
1931 Oct.	72.4	67.6	N.A.
1934 Oct.	72.4	(67.3)	(86.1)
1935 Oct.	73.3	(67.8)	(86.2)
1936 Oct.	74.2	(68.4)	(86.1)
1937 Oct.	75.2	(69.2)	(85.2)
1938 July	75.8	68.8	83.9
1939 Oct.	76.5	(66.6)	(84.5)
1942 July	80.4	67.5	88.5
1948 Jan.	84.4	79.1	92.2

[1] In general, 'skilled' mean fitters (other than toolroom fitters); 'semi-skilled' are represented by turners and machinemen rated below fitters' rate; and 'unskilled' mean labourers. The figures in brackets, in this table and in Table III, are estimates (see Appendix).

[2] These differentials were calculated in a different way from those given in the previous article, because of the need to give figures for particular months (see Appendix).

[3] Earnings data for labourers were compiled for March. (No changes in rates took place between March and October).

estimated by a consideration of time rates, although the differential was still around 80 per cent. This over-estimation was also evidenced in the past (Table II); more important, the course of the skill differential based on actual earnings differed markedly from the course of that based on rates.

While the 'rates skill differential' rose consistently, the 'earnings skill differential' moved downward after 1928 until 1934, and again after 1937 until 1939—reflecting the depression of 1931 and the recession of 1938. This effect (which might have been expected to appear in the rates skill differential, but did not in fact occur) shows the reduced relative earning capacity of the unskilled in times of slump, and suggests that at such times the unskilled have less bargaining power—possibly owing to reduced job security.

The persistent widening of the earnings skill differential until 1934 and 1939 cannot be explained by supposing that the unskilled suffered differentially from short time. Although there was some short time in 1931, which affected the unskilled to a fractionally greater extent than the skilled, by 1934—when the greatest widening of the earnings skill differential had occurred—there was very little short time, and the hours of the unskilled had disproportionately increased. In 1938 there was a slight drop in the average hours of the skilled, but not of the unskilled; and by 1939 there were substantial increases in the hours of both.[1] Thus the unskilled, owing to the cumulative effects of depression conditions, found difficulty—despite longer hours—in regaining their position.

Moreover, in the immediate pre-war period from Munich onwards, the rearmament boom put a premium on skilled work in the industry; and the skilled workers increased their relative lead at least up to 1942. However, as the war progressed—with the dilution of skilled labour, with the manpower shortage (the unskilled being more liable to be called up for military service), and with the growth of piece-work methods and output drives—the relative earning advantages achieved by the skilled were to some extent forfeited. The last column in Table II refers to the ' semi-skilled ' grades. The differential for the semi-skilled began to widen in 1937, and their recovery by 1942 was due to high wartime piece-work earnings.

In Table III we give the figures of time rates and average earnings from which the differentials in Table II were derived.

TABLE III

Average Rates and Average Weekly Earnings for Three Grades of Skill, 1926–1948 (*shillings*)

Year and Month	*Skilled*		*Semi-skilled*[1]	*Unskilled*	
	rates (time-workers)	earnings (time and P. by R. together)	earnings (time and P. by R. together)	rates (time-workers)	earnings (time and P. by R. together)
1926 Oct.	56.0	66.9	N.A.	40.0	45.7
1928 Oct.[2]	58.0	71.8	N.A.	42.0	49.2
1931 Oct.	58.0	66.5	N.A.	42.0	45.0
1934 Oct.	58.0	(74.6)	(64.2)	42.0	50.2
1935 Oct.	60.0	(78.5)	(67.7)	44.0	53.3
1936 Oct.	62.0	(83.1)	(71.6)	46.0	56.8
1937 Oct.	64.5	(87.4)	(74.5)	48.5	60.5
1938 July	66.0	88.8	74.6	50.0	61.1
1939 Oct.	68.0	(104.1)	(87.9)	52.0	69.4
1942 July	81.5	148.8	131.7	65.5	100.4
1948 Jan.	102.0	146.6	135.1	86.0	115.8

[1] Earnings figures alone are available for the semi-skilled, since these grades have no regular negotiated rates.

[2] Earnings data for labourers were compiled in March. (No changes in rates took place between March and October).

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[1] Taking hours in 1928 as=100 for both skilled and unskilled, by 1931 they were : skilled, 94.0 ; unskilled, 93.3 ; and by 1934, skilled, 100.8 ; unskilled, 102.7. Taking hours in 1937 as=100, in 1938 they were: skilled, 99.2 ; unskilled, 100.2 ; and in 1939 they were about 106.5 for both grades.

Rates and earnings have both increased over successive years except that earnings fell in 1931.[1] (Thus, although in 1931 the widening of the differential was attended by a fall in earnings, this was not so in 1938). Average earnings are of course higher than rates, and this divergence has increased over the period.

Up to this point we have accepted the convention of regarding the 'skilled' category as represented by fitters. Fitters are taken as representative of skilled grades primarily because they are numerous ; but there are higher grades of skill, and consequently of course other skill differentials. In Table IV we show the relationship of the earnings of workers in a number of different occupations in the industry to fitters' earnings, at January 1948.

TABLE IV

Earnings in Certain Occupations in Relation to Fitters' Earnings at January 1948

	Occupation[1]	*Average Weekly Earnings* shillings	as percentage of fitters' earnings
1	Sheet metal workers (skilled)	163.1	*111.3*
2	Toolroom fitters and turners	159.7	*108.9*
3	Moulders (loose pattern)	154.4	*105.3*
4	Patternmakers	152.7	*104.2*
5	Turners and machinemen (rated at or above fitters' rate)...	146.6	*100.0*
6	Fitters (other than toolroom)	146.6	*100.0*
7	Platers, riveters, and caulkers	146.5	*100.0*
8	Turners and machinemen (rated below fitters' rate) ...	135.1	*92.2*
9	Labourers	115.9	*79.1*
10	All above workers	139.3	—

[1] The proportions working in each of these occupations, according to our 'sample', were as follows : 1, 3.0 per cent ; 2, 6.4 per cent ; 3, 4.3 per cent ; 4, 1.7 per cent ; 5, 18.2 per cent ; 6, 23.6 per cent ; 7, 2.7 per cent ; 8, 17.1 per cent ; 9, 23.0 per cent.

Most of these categories, of course, are skilled. The categories of turners and machinemen (Nos. 5 and 8) are 'omnibus categories' and include many occupations created by the increase in the numbers and types of machines; category 8 may be taken, very generally, as typical of the 'semi-skilled'. We have not attempted a corresponding picture of rates, since only fitters' and labourers' rates are completely covered by agreements; the rates of other categories tend to be fixed—sometimes merely by 'understandings'—in relation to those of fitters and labourers. Workers in some of the smaller skilled categories enjoy a considerable differential over the 'representative' skilled category of fitters.

However, figures of average earnings for all workers in skill and occupational groupings conceal one of the major differences in earning capacity—that between the time-worker and the payment by results worker.

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[1] Indeed, in several localities in 1931 earnings for fitters and for labourers were below the existing rates for the 47-hour week, because of short time.

III. Time-workers and Payment by Results Workers

P. by R. workers, of course, generally earn more than time-workers. But the extent to which they do so, and their relative numbers, vary from occupation to occupation and from region to region. Table V shows the average earnings of time-workers and P. by R. workers, as well as the numbers of each, in the nine occupational categories at January 1948.

Table V

Relative Earnings of Time-workers and P. by R. Workers, and Relative Numbers at January 1948

Occupation	*Average Weekly Earnings (shillings)*			*Numbers of Workers (thousands)*		
	a time-workers	*b* P. by R. workers	*c* *b* as % of *a*	*d* time-workers	*e* P. by R. workers	*f* P. by R. as % of total
1 Sheet metal workers (skilled)	142.5	169.6	*119.0*	2.9	9.4	*76.3*
2 Toolroom fitters and turners	158.1	162.6	*102.9*	17.6	9.0	*33.8*
3 Moulders (loose pattern)	135.1	163.2	*120.8*	5.5	12.2	*68.7*
4 Patternmakers	146.3	158.2	*108.1*	3.3	3.9	*54.5*
5 Turners and machinemen (rated at or above fitters' rate)	134.9	150.7	*111.7*	19.6	55.8	*74.0*
6 Fitters (other than toolroom)	140.7	150.3	*106.8*	38.2	59.2	*60.8*
7 Platers, riveters, and caulkers	136.5	152.7	*111.8*	4.3	7.0	*61.8*
8 Turners and machinemen (rated below fitters' rate)	115.3	138.7	*120.4*	11.0	59.7	*84.5*
9 Labourers	113.4	124.5	*109.8*	73.6	21.5	*22.6*
10 All above workers	128.7	147.3	*114.4*	176.0	237.7	*57.5*

The percentage by which, on the average for all occupations, P. by R. earnings exceeded time-work earnings was 14.4 per cent (Column *c*); and the number of P. by R. workers was 57.5 per cent of the total (Column *f*). For three occupations the excess of P. by R. earnings was about 20 per cent: two of these (sheet metal workers and moulders) are fairly small skilled groups, while the other represents the large category of 'semi-skilled' workers. Column *f* shows that this semi-skilled category had by far the largest proportion of P. by R. workers, although both the other categories also had relatively large numbers on P. by R. Fitters, the largest category of skilled workers, did not benefit from P. by R. as much as most of the other skilled categories—either through high P. by R. earnings or through having large numbers on P. by R. Turners and machinemen rated above fitters (the other large skilled category) included a very high proportion of P. by R. workers, but did not benefit in earnings to more than an average extent from P. by R. In contrast to the other skilled groups, toolroom fitters and turners enjoyed high time-work earnings which were little below their P. by R. earnings; so that these workers, despite the fact that few of them were on P. by R., were able to maintain earnings (for time- and P. by R. workers together) at a high level. The patternmakers' position was in some respects analogous. The large category of unskilled labourers had a very small proportion of P. by R. workers, and here P. by R. earnings exceeded time-work earnings by less than the average; so that the relative income status of the category as a whole remained low.

There were marked differences between localities in the earnings of time-workers and P. by R. workers. While on the average the P. by R. workers earned 14.4 per cent more than the time-workers, there were two localities where the excess was over 40 per cent, and one where it was as low as 0.5 per cent. In particular occupations, time-workers' earnings occasionally exceeded P. by R. workers' : there were eight localities where this occurred for fitters, six for labourers, and one for the ' semi-skilled '. In general, however, the P. by R. workers' differential over time-workers remains important. While it is on the whole not quite as wide as the skill differential, it does nevertheless sometimes blur the skill gradation as reflected in earnings. Indeed, in six localities the unskilled labourer on P. by R. was able to earn more than the skilled fitter on time-work; nor was this always due to excessive overtime.[1]

Enough has been said to show that P. by R. systems operate differently between occupations, and even within occupations; and that they may blur or even invert other established wage differentials. We should therefore enquire into the intended relationship between P. by R. workers' and time-workers' wages.

The principle by which the level of P. by R. earnings is theoretically determined is that the earnings of P. by R. workers 'of average ability' should exceed time rates by a minimum percentage.[2] (This stood at 33 1-3 per cent up to 1931; was then reduced to 25 per cent until 1943; and was 27½ per cent from then until 1950.) ' Basic ' time rates should be distinguished from actual time rates including National Bonuses. The practice of granting a National Bonus was introduced in 1917 to meet exceptional circumstances, and was continued; so that a distinction arose between ' basic' time rates and what we have called ' actual ' time rates. The P. by R. workers' percentage has been calculated on the basic time rate, but P. by R. workers have also sometimes been granted National Bonuses—although to a lesser total amount than time-workers. The general result has been a reduction of the P. by R. workers' percentage over actual time rates.

For the categories of fitters and labourers, weighted averages of P. by R. workers' ' rates '—' or expected minimum earnings '—have been calculated for January 1948, for the same regions as the earnings figures. (P. by R. workers' ' rates ' are taken as the time-workers' basic rates plus 27½ per cent plus the P. by R. workers' total National Bonus). In Table VI these are compared with the time-workers' rates[3] and with the average actual earnings of time-workers and P. by R. workers in the two occupations.

[1] In one locality the average money difference was as much as £3 9s. 8½d. Although this was to some extent due to the labourers working overtime, their hourly earnings were still higher than those of fitters by nearly 8d.

[2] This is commonly known as the ' minimum piecework standard '.

[3] On the ' new basis ' ; *cf.* Table I.

TABLE VI

Rates and Weekly Earnings for Time-workers and P. by R. workers (Fitters and Labourers only[1]*) at January 1948 (shillings)*

	Fitters	Labourers
1 Time-workers' rate	102.8	87.3
2 P. by R. workers' 'rate' (or 'expected minimum earnings') ...	113.0	93.2
P. by R. workers' 'expected minimum percentage' (*i.e.* percentage difference of 2 over 1)	*10.0%*	*6.8%*
3 Time-workers' earnings	140.7	113.4
4 P. by R. workers' earnings	150.3	124.5
P. by R. workers' actual percentage (*i.e.* percentage difference of 4 over 3)	*6.8%*	*9.8%*

[1] It may be noted in passing that the skill differentials on earnings are: time-workers, 80.6 per cent; P. by R. workers, 82.8 per cent.

Obviously, P. by R. workers' actual earnings were well above their 'rates'. Complaints have however often been made that the P. by R. percentage should have been calculated on actual time rates[1] instead of on basic rates. (The combined effect of calculating the 27½ per cent on basic rates and of having given a larger Bonus to time-workers was that the actual P. by R. workers' percentage amounted only to 10.0 per cent for fitters and 6.8 per cent for labourers on actual time rates—as is shown in Table VI.) If then P. by R. workers' actual earnings are compared with actual time rates (items 4 and 1 in the table above), they exceeded these by 46.2 per cent for fitters and 42.6 per cent for labourers, which is far above the 'expected minimum percentage' if this is taken as 27½ per cent. But time-workers' earnings were also well above actual time rates, and when P. by R. workers' earnings are compared with time-workers' earnings, P. by R. earnings exceeded time-work earnings by 6.8 per cent for fitters and 9.8 per cent for labourers. Thus, while the percentage by which P. by R. earnings exceeded time rates (on any definition of the latter) was higher than was theoretically expected, the excess of P. by R. workers' actual earnings over those of time-workers was, like that of P. by R. 'rates' over time rates, between 5 and 10 per cent. Time-workers in fact appear to have had their rates supplemented in one way or another about as much proportionately as P. by R. workers, and the flattening of the P. by R. workers' differential in rates[2] seems to have been more or less realised in earnings.

These comments relate of course to January 1948. However, subsequent wage agreements have altered the position, and we must examine the alterations in time rates and in the minimum piecework standard in order to give some idea of the changes which may be expected to have occurred in the levels of earnings since 1948. This can, of course, provide only the roughest approximation.

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[1] The time-workers' National Bonus has (November 1950) been included in a 'consolidated minimum time rate'; but the P. by R. workers' percentage, though increased, is still calculated on the basic rate.

[2] In engineering, the P. by R. workers' differential over actual time rates came to between 5 and 10 per cent. However, in industries where there is no National Bonus, *i.e.* where increases are incorporated into time rates—this differential tends to be wider. For example, in building it is 20 per cent, and in boot and shoe manufacture it is 25 or 37½ per cent.

Since January 1948 there have been two national changes in engineering rates. On Oct. 4th, 1948, national minimum basic rates were established, and the National Bonus was increased by 5s.; so that (national minimum) time rates became 107.0 shillings for fitters and 92.0 shillings for labourers, and the (national minimum) P. by R. workers' ' rates ' became 117.2 and 98.0 shillings respectively. On Nov. 13th, 1950, a new agreement provided for ' consolidated minimum time rates ' of 118.0 and 100.0 shillings respectively. The P. by R. percentage, still calculated on the basic rates, was raised to 45 per cent; thus the P. by R. workers' new ' rates ' were 128.8 and 106.9 shillings respectively But at the same time a new principle was introduced, by which those time-workers whose total rates—including ' lieu rates ', ' merit rates ', etc., had already reached 128.2 shillings (fitters) and 106.0 shillings (labourers) should receive no increases. Thus the time rate is now acknowledged to be a minimum, since increases in it no longer apply automatically to all workers but only to those whose total rates of all types are considered to be not too far above it. The main purposes of the new agreement seem to have been to widen the skill differential (by giving skilled workers 11s. and unskilled 8s.), and at the same time to reduce the disparity of earnings of workers within particular occupations (by granting increases only to the lower paid time-workers, and by raising the ' expected minimum earnings ' of P. by R. workers without granting them a general increase).

Time-workers' average earnings in 1948 were, for fitters and labourers —as shown in Table VI—140.7 and 113.4 shillings; and these were already above the ' stop ' in rates established in 1950. Both received the 5s. increase on the National Bonus on Oct. 4th, 1948; and, to judge from the Ministry of Labour's figures of average earnings for the last pay weeks of October 1948 and October 1950, there was a substantial increase in earnings[1] between the dates of the two increases in wage rates. Though our 1948 figures relate to earnings, they are not over-inflated by overtime payment[2]; and since they refer to time-workers, whose pay consists principally of various types of rate, it may be assumed—in view of the increases in both rates and earnings since January 1948—that considerable numbers, though it is impossible to say how many, came above the ' stop ' level in November 1950. (There has of course been no attempt to establish any other kind of limitation on earnings.[3])

[1] In ' metal manufacture ', the increase in average earnings for adult males was 14s. 2d. ; in ' engineering, shipbuilding, and electrical goods ' it was 10s. 5d. ; in ' vehicles ' it was 11s. 5d. ; and in ' metal goods not elsewhere specified ' it was 14s. 6d. (In these industries there was on the average only about one hour's increase in overtime working.)

[2] In January 1948 the average overtime worked was 2.9 hours for fitters and 3.9 hours for labourers (time-workers). This amount of overtime does not invalidate the general argument.

[3] It seems probable moreover that increases in rates have been arranged locally in many cases, chiefly no doubt among non-Federated firms. Indeed, the bigger of these firms, not being bound by the Federation, may often be inclined to conclude separate agreements more favourable than the national Federation agreements.

As for the P. by R. workers, it is again obvious that the new 'expected minimum earnings' (which reached 128.8 and 106.9 shillings in 1950) were well below the average earnings of 1948, let alone the higher levels which may be presumed to have been achieved by 1950. The result of the latest wage change here too will have been to establish a minimum.

In concluding this section we indicate the course of the P. by R. workers' differential over time-workers for the three categories of skill over a period of years (Table VII).

TABLE VII

Average Weekly Earnings of Time-workers and P. by R. workers, 1926–1948 (shillings)

	1926 (Oct.)	1928 (Oct.)	1931 (Oct.)	1938 (July)	1942 (July)	1948 (Jan.)
Skilled :						
Time-workers	60.3	65.7	61.7	81.5	126.3	140.7
P. by R. workers	70.3	76.8	70.3	93.4	158.5	150.3
P. by R. as % of T	*116.4*	*117.1*	*114.1*	*114.6*	*125.6*	*106.8*
Semi-skilled						
Time-workers	N.A.	N.A.	N.A.	64.7	109.9	115.3
P. by R. workers	N.A.	N.A.	N.A.	76.9	136.4	138.7
P. by R. as % of T	N.A.	N.A.	N.A.	*119.0*	*124.1*	*120.4*
Unskilled						
Time-workers	44.5	48.0	44.1	60.2	97.6	113.3
P. by R. Workers	53.0	56.0	49.3	66.1	109.8	124.5
P. by R. as % of T	*119.2*	*116.7*	*111.8*	*109.9*	*112.4*	*109.8*

For both skilled and unskilled workers the P. by R. differential has narrowed fairly steadily throughout the period. It rose sharply for all three categories during the war, and the post-war narrowing affected the skilled workers most and the semi-skilled least. The strengthening of the skilled workers' position in the early part of the war was reflected in a high P. by R. differential; but this gain was short-lived, presumably because of intensive dilution. If 1948 is compared with 1938, the P. by R. differential for fitters has narrowed sharply, while for the semi-skilled—of whom the greatest proportion are working on P. by R. systems—it has slightly risen.

TABLE VIII

Relative Numbers of P. by R. Workers in Three Grades of Skill, 1926–1948 (and Total Numbers of Workers)

Year and Month	*Relative numbers of P. by R. workers (P. by R. as % of total workers)*			*Total numbers of workers in 'samples' (time and P. by R. together, 000)*		
	skilled	semi-skilled	unskilled	skilled	semi-skilled	unskilled
1926 Oct.	*51.1*	N.A.	*13.9*	44.6	N.A.	50.8
1928 Oct.	*55.0*	N.A.	*14.5*	48.6	N.A.	51.2
1931 Oct.	*56.1*	N.A.	*16.3*	34.8	N.A.	32.8
1938 July	*62.1*	*80.8*	*14.8*	62.9	47.5	68.1
1942 July	*69.9*	*82.3*	*22.6*	118.4	89.4	105.6
1948 Jan.	*60.8*	*84.5*	*22.6*	97.4	70.7	95.1

P. by R. has of course developed during the period (Table VIII—where the actual numbers of workers in our ' samples ' are also given).

The growth of P. by R. during the war is evident; and though it declined afterwards relatively among skilled and unskilled workers, it continued to develop among the semi-skilled. Thus the semi-skilled P. by R. workers' position has been strengthened since the war, both by an increase in relative numbers and by a lesser decline in relative earnings.

IV. Hours and Hourly Earnings

We have hitherto largely disregarded the number of hours worked, since hours of work are not at present a major industrial issue, and differences in hours worked are not big enough to give a pattern of hourly earnings which substantially alters that of weekly earnings. Nevertheless there are certain differences between occupations in the number of hours worked. In Table IX we give average hours for nine occupations at January 1948.

Table IX

Hours Worked and Overtime Hours of Time-workers and P. by R. Workers at January 1948

Occupation	*Average hours,* time & P. by R. workers together	*Average hours* a time-workers	b P. by R. workers	c b as % of a	*Average over-time hours* time-workers	P. by R. workers
1 Sheet metal workers (skilled)	43.9	45.8	43.3	*94.6*	1.8	—0.7
2 Toolroom fitters and turners ...	44.8	44.9	44.6	*99.3*	0.9	0.6
3 Moulders (loose pattern) ...	44.3	45.5	43.8	*96.3*	1.5	—0.2
4 Patternmakers	45.0	45.0	45.0	*100.0*	1.0	1.0
5 Turners & machinemen (rated at or above fitters' rate) ...	44.6	45.3	44.4	*98.1*	1.3	0.4
6 Fitters (other than toolroom)	45.6	46.9	44.8	*95.5*	2.9	1.8
7 Platers, riveters and caulkers...	45.0	45.7	44.5	*97.4*	1.7	0.5
8 Turners & machinemen (rated below fitters' rate)	44.3	45.5	44.1	*97.0*	1.5	0.1
9 Labourers	47.7	47.9	47.1	*98.4*	3.9	3.1
10 All above workers	45.5	46.7	44.6	*95.5*	2.7	0.6

P. by R. workers consistently worked shorter hours than time-workers (Column c). Moreover, P. by R. workers in the two skilled groups (1 and 3), whose earnings (Table V) were much in excess of time-workers' earnings, worked less than the normal 44-hour week. P. by R. workers in the semi-skilled category (turners and machinemen rated below fitters), whose earnings were also much above time-workers', worked least overtime. In the three categories where the proportion of P. by R. workers was lowest (labourers, toolroom fitters and turners, and patternmakers), their hours came closest to the time-workers'. Labourers—the lowest-paid category—worked the longest hours.

If we consider remuneration per actual hour of effort,[1] then while the general pattern of earnings is substantially unchanged, the contrasts are more marked—because the relatively high-paid workers (*e.g.* the P. by R. workers in general, and the two highly skilled groups in particular) work less than average hours, while the low-paid workers (*e.g.* the time-workers in general, and the labourers in particular) work more than average hours (Table X).

TABLE X. *Hourly Earnings at January, 1948*

Occupation	*Average hourly earnings* (shillings) time and P. by R. workers together	as % of fitters	*Average hourly earnings* (shillings) a time-workers	b P. by R. workers	c b as % of a
1 Sheet metal workers (skilled)	3.74	*116.2*	3.14	3.93	*125.2*
2 Toolroom fitters and turners	3.65	*113.4*	3.65	3.66	*100.3*
3 Moulders (loose pattern) ...	3.49	*108.4*	2.97	3.73	*125.6*
4 Patternmakers	3.40	*111.8*	3.25	3.52	*108.3*
5 Turners and machinemen (rated at or above fitters' rate)	3.29	*102.2*	2.96	3.40	*115.0*
6 *Fitters* (*other than toolroom*)	3.22	100.0	3.01	3.35	*111.3*
7 Platers, riveters and caulkers	3.27	*101.6*	3.01	3.43	*113.9*
8 Turners and machinemen (rated below fitters' rate) ...	3.05	*94.7*	2.53	3.15	*124.5*
9 Labourers	2.45	*76.1*	2.39	2.64	*110.5*
10 All above workers	3.09	—	2.78	3.31	*119.0*

If relative hourly earnings are compared with relative weekly earnings, P. by R. workers in almost every case increased their lead over time-workers (Column c of Table X and Column c of Table V) ; and workers in almost all occupations[2] improved their position in relation to fitters—because fitters worked relatively long hours (second column of Table X and second column of Table IV). The pattern of hours worked has been much the same for a number of years (Table XI).

TABLE XI. *Average Hours Worked by Time-workers and P. by R. Workers in Three Grades of Skill, 1926–1948*

Year and month	*Time-workers* skilled	semi-skilled	un-skilled	*P. by R. Workers* skilled	semi-skilled	un-skilled
1926 October ...	47.1	N.A.	48.2	46.1	N.A.	45.5
1928 October ...	49.2	N.A.	49.4	47.8	N.A.	48.9
1931 October ...	46.0	N.A.	46.3	45.2	N.A.	44.8
1938 July	51.0	49.1	51.4	49.8	47.8	49.2
1942 July	56.3	56.3	57.5	54.5	54.4	57.1
1948 January ...	46.9	45.5	47.9	44.8	44.1	47.1

[1] The figure of ' hourly earnings ' is strictly speaking fictitious, in that any division of an average of weekly earnings by an average of weekly hours worked ignores the extent to which overtime working, paid for at higher rates, is concealed in the averages. This difficulty cannot be overcome either by assuming that average hours of overtime are paid for at some enhanced rate, or by calculating an average hour of overtime as equivalent to more than one hour of plain time. We cannot know what the real overtime component is, since we do not know how much short time is being worked. To avoid the more obvious sources of error, we have calculated hourly earnings for each region separately, and our average hourly earnings are weighted averages of these regional figures. (Somewhat similar criticisms might of course be made of our ' average overtime ' figures in Table IX.)

[2] The only exception—labourers—worked the longest hours of all.

Average hours for time-workers were always longer than for P. by R. workers. Unskilled time-workers consistently worked longer hours than either skilled or semi-skilled workers (though this was not always true of unskilled P. by R. workers). In general, the semi-skilled worked shorter hours than either skilled or unskilled. The extent of short time in 1931 (when there was a 47-hour week), and the increase in average hours immediately before and during the war, are obvious.

V. Regional Differences

There are considerable local differences in the level of earnings. Even between the 12 broad areas into which the 46 regions have been grouped, the diversity is about as great as the occupational skill differential. But if individual regions are considered, there are startling anomalies. For instance, in one region the semi-skilled P. by R. workers (a category comprising in this case several thousand workers working on the average 2½ hours less than the normal week) were able in 1948 to earn more than the P. by R. sheet metal workers in more than half the 40 regions for which data were available—and sheet metal workers on P. by R. were, for the country as a whole, the most highly-paid section of all. If the regional averages of earnings by occupation could be broken down further—for example by separate firms—more remarkable cases would obviously be revealed.

Earnings by area at January 1948 are shown on Map I. (The pecularities in the definition of some of the areas were imposed by the way in which our statistical sources were originally compiled.)

In 1948 earnings were highest in the Midlands and the South, which are populous, prosperous, and still expanding; and, in general, earnings decline as we move northwards and outwards. Table XII, to which the map relates, shows that high average earnings in some areas cannot be accounted for by a higher proportion of P. by R. workers, nor by a differentially high level of P. by R. earnings, nor by especially long hours. Although there are considerable variations in all these factors, there is no systematic connection between them and relative levels of average earnings.

But, while in most areas there are many different types of engineering, in some there tends to be a preponderance of a particular type (usually because this is closely associated with some specialised industry which characterises the area in general);[1] and differences in the type of engineering are reflected in the earnings of both time- and P. by R. workers. In Table XIII we have as far as possible regrouped the regions, inevitably in a rather rough fashion, according to certain predominant types of engineering—taking time-workers and P. by R. workers together.

Earnings in marine engineering and textile engineering areas tend to be low, while those in motor engineering areas are high. (It is, incidentally, interesting to note that the numbers of hours worked are almost in inverse

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[1] In certain localities, of course, where engineering itself is the dominant industry, it may itself act as the wage leader.

MAP 1

Average weekly earnings in engineering (by areas, at January 1948)

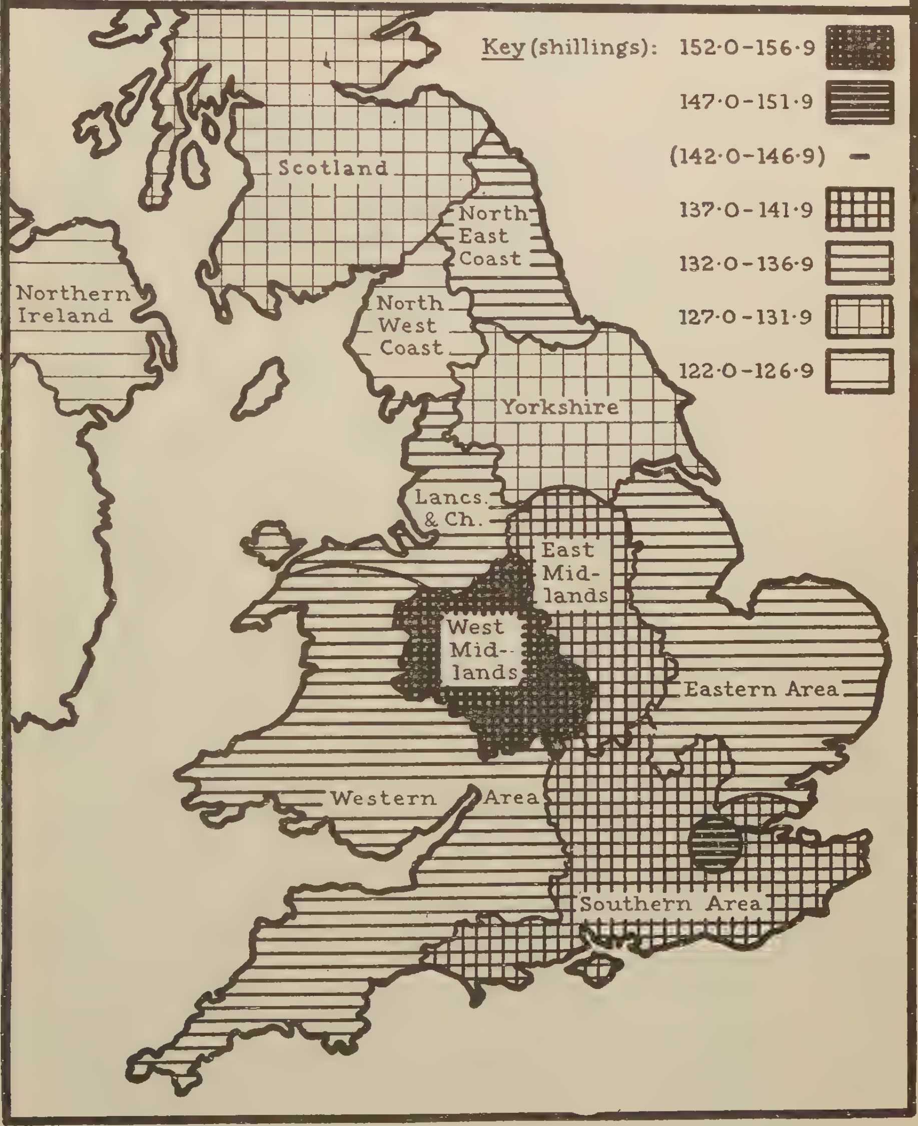

TABLE XII

Average Earnings and Hours by Areas at January, 1948

Area	*Nos. of workers* (time & P. by R. together, 000)	*Nos. of P. by R. workers as % of total workers*	*Average weekly earnings* (*shillings*)			*Average hours* (time & P. by R. together)	*Average hourly earnings* (time & P. by R. together, shillings)
			time & P. by R. together	time-workers	P. by R. workers		
1 Western Area ...	25.8	*54.7*	134.6	126.1	141.6	45.0	2.99
2 Southern Area ...	13.5	*60.7*	137.4	126.0	144.7	45.4	3.04
3 London	53.6	*52.3*	147.2	139.7	154.0	45.3	3.26
4 West Midlands ...	73.0	*58.0*	154.2	141.9	163.1	45.0	3.51
5 East Midlands ...	39.0	*59.2*	138.8	126.8	147.0	45.9	3.04
6 Eastern Area ...	21.0	*66.1*	136.0	125.2	141.6	44.8	2.98
7 Lancs. and Cheshire ...	74.7	*62.2*	135.0	124.1	141.7	46.0	2.94
8 Yorkshire	27.1	*55.2*	128.6	119.8	135.8	45.3	2.85
9 N.W. Coast	5.1	*64.0*	124.5	102.7	136.8	44.3	2.81
10 N.E. Coast	27.8	*51.9*	135.2	124.2	145.4	47.1	2.87
11 Scotland	45.1	*54.5*	131.5	120.5	140.7	46.4	2.83
12 Northern Ireland ...	10.1	*47.3*	125.7	114.9	137.6	44.8	2.82
All Areas	415.9	*57.3*	139.6	129.4	147.2	45.6	3.07

TABLE XIII

Average Earnings and Hours according to the Predominant Type of Engineering at January 1948

Predominant type of engineering	Numbers of workers (000)	Av. weekly earnings (shillings)	Average hours	Average hourly earnings (shillings)
1 Marine	85.8	132.2	46.3	2.86
2 Textile...	41.5	133.0	45.6	2.93
3 Motor and cycle ...	75.2	154.1	45.0	3.51
4 Agricultural	14.8	134.3	45.1	2.94
5 General or Mixed ...	198.6	138.4	45.5	3.04
All engineering	415.9	139.6	45.6	3.07

order to the amount of money earned.) The West Midlands is associated with motor engineering, and Northern Ireland, the North West Coast, and Scotland with marine engineering; textile engineering is mainly found in Yorkshire and Lancashire. Of these areas, the West Midlands has the highest earnings, while in the others earnings are low (Table XII).[1] Other factors may, of course, be relevant : low engineering earnings are possibly associated with low earnings generally (especially perhaps in the textile areas); present-day unemployment tends to be higher in most of the areas of low engineering earnings (though unemployment levels are now so low that it seems unlikely that this has much effect); and, also, high living costs tend to produce higher earnings (this is traditionally true of London, and may now partly explain high engineering earnings in the South generally).

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[1] The North East Coast, also a marine engineering area, has rather higher earnings than might have been expected. It may be relevant to recall that this area has a long history of good industrial relations.

Average earnings in the highest area of Table XII were 28s. 6d. (or 23 per cent.) above the level in the lowest. The spread was not uniform, since the two highest areas were well ahead of the rest. There is, of course, greater divergence in earnings between individual regions than between the broad areas. In the highest of the regions, where there were almost 20,000 workers in the ' sample ', average earnings (£8 11s. 7½d.) were 59 s. 7½d. or 53 per cent above those in the lowest, and 21s. 3d. (or 14 per cent) above those in the next in order. Moreover in this region earnings for both time-workers and P. by R. workers in all occupations were well above average. In fact, it seems true in general that high or low earnings in particular regions were not due to differentially high levels of P. by R. earnings, nor to the influence of exceptionally high earnings in one or other of the skilled occupations (such as might have been caused by exceptional scarcity). Nor were they by any means always attributable to the existence of a high or low proportion of P. by R. workers. High or low earnings in particular regions, just as in particular areas, appear to have been primarily due to the fact that the earnings of all workers—time-workers and P. by R. workers in all occupations—were relatively high or low, rather than that exceptional conditions obtained for workers of a particular type or occupation.[1] High average earnings reflected a general prosperity and capacity to pay throughout the region as a whole—or in that section of the engineering industry with which the region was predominantly associated.

The area pattern of average earnings was naturally different in previous years (Map 2 and Table XIV).

London has, over time, lost its leading position, particularly during the war; while the positions of the West Midlands, and also in general of the Southern Area, have improved.[2] The rise of the West Midlands to first place has presumably been due to its importance in war production and in the post-war export drive. Developments in the aircraft industry during and shortly before the war seem to have contributed to considerable changes in area earnings: this factor, coupled with exceptionally long working hours, probably accounted for the marked change in the position of Northern Ireland during the war. In the Southern Area too, the expansion of aircraft production seems relevant: the numbers of workers in our ' samples ' in both Southern and Western Areas had grown greatly even by 1938.[3]

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[1] In the three regions of highest earnings, the earnings of both time-workers and P. by R. workers in each occupation were well above the average for their category, while in the three lowest regions they were below. The proportion of P. by R. workers in two of the three highest regions was below the average; but in the highest regions of all there was a markedly high proportion of these workers, and in one of the lowest regions the proportion was very low indeed. Thus while in general it is still true that the proportion of P. by R. workers does not fully account for divergences in average earnings, this factor may be important in extreme cases—notably in the exceptionally high earnings region.

[2] The figures for 1948 in Table XIV differ slightly from those in Table XII. The Table XII figures were fully representative, but those in Table XIV, on which Map 2 is based, could be obtained, throughout the whole period, for fitters and labourers only.

[3] This growth—while of course strictly speaking merely an increase in the numbers of workers covered by our data—may reflect a real expansion due to the influx of workers after the slump (' Western Area ' did not include South Wales until 1942), and also the beginnings of rearmament in aircraft.

MAP 2

Average weekly earnings in engineering, in order of areas.

1926-1948.

(The three areas of highest earnings have been shaded.)

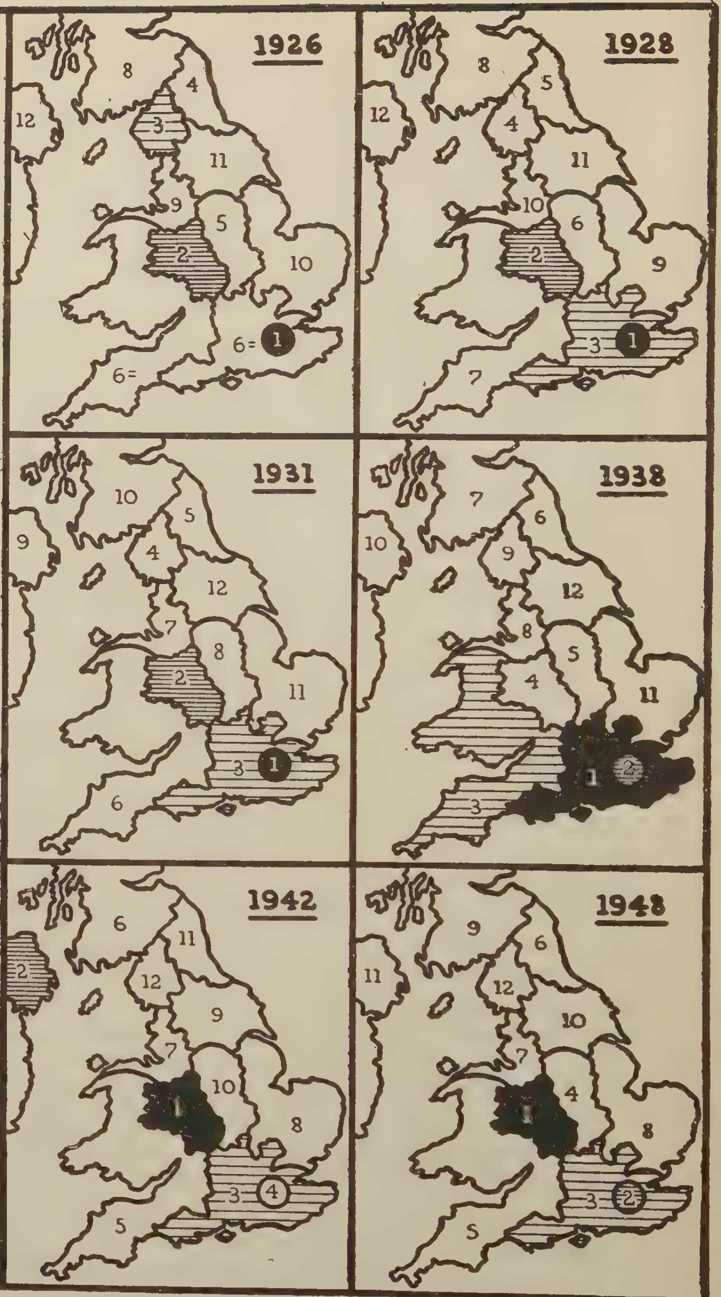

Table XIV

Average[1] Weekly Earnings by Areas, 1926–1948 (*shillings*)

Area	1926 (October)	1928 (October)	1931 (October)	1938 (July)	1942 (July)	1948 (January)
1 Western Area ...	53.5 —	58.4 —	54.8 —	79.9 (77.3)	122.2 (122.2)	129.1 (128.5)
2 Southern Area	53.5 —	61.8 —	58.4 —	86.8 (84.9)	141.2 (138.1)	132.6 (131.7)
3 London ...	63.4 —	68.4 —	64.0 —	80.0 (79.5)	133.4 (132.2)	140.0 (139.1)
4 West Midlands ...	62.3 —	67.2 —	62.7 —	76.0 (76.0)	146.7 (149.9)	143.0 (145.3)
5 East Midlands ...	53.6 —	59.3 —	52.7 —	75.9 (77.8)	112.9 (120.0)	131.9 (133.5)
6 Eastern Area ...	51.8 —	57.6 —	49.8 —	68.3 (70.4)	114.8 (116.9)	126.9 (131.2)
7 Lancs. & Cheshire	52.8 —	55.6 —	54.4 —	71.5 (71.5)	121.2 (122.4)	127.9 (128.6)
8 Yorkshire ...	49.1 —	54.0 —	49.2 —	65.0 (64.7)	113.5 (113.7)	123.5 (123.4)
9 N.W. Coast ...	60.4 —	61.4 —	57.9 —	71.4 (73.1)	99.3 (101.0)	114.7 (116.2)
10 N.E. Coast ...	57.6 —	60.8 —	57.0 —	74.5 (75.4)	110.9 (113.5)	128.5 (129.8)
11 Scotland	53.0 —	58.2 —	52.3 —	72.0 (72.0)	121.4 (122.4)	124.8 (125.3)
12 Northern Ireland	48.6 —	52.9 —	52.5 —	69.2 (69.1)	142.5 (140.6)	119.6 (120.1)
All Areas	55.6 —	60.2 —	56.1 —	74.4 (74.5)	126.0 (127.6)	131.3 (132.3)

[1] 'Skilled' and 'unskilled' (fitters and labourers) only. The figures given in brackets for the latter three years, however, include 'semi-skilled' also (turners and machinemen rated below fitters' rate).

The differences between average earnings in the highest and lowest areas (Table XIV) have been as follows. In 1926 the highest was about 31 per cent above the lowest; in 1928 the difference was 28 per cent; in 1931, 30 per cent; in 1938, 34 per cent; in 1942, 48 per cent; and in 1948, 25 per cent. Thus before the war there was little change in the difference between the extremes; during the war the difference increased; and since the war it has sharply narrowed. While the different fortunes of the various areas in the inter-war depression did not produce a correspondingly diverse pattern of average earnings, the intensification of activity during the war—which was coupled with changes in the industrial structure of engineering—did increase the divergence. Since the war, the levelling-up of the fortunes of the different areas, together with the establishment of a more stable pattern of productive activity, has caused a narrowing of the divergence.[1]

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[1] The divergence between areas in rates was throughout the period smaller than that in earnings, and has decreased fairly consistently. The reduction in this divergence, which has been one of the main objectives of the Unions during the period, may have contributed in the long run to the recent reduction in the divergence of earnings. The general tendency to uniformity in living habits because of rationing, price controls, scarcities and austerities may have led to a decrease in regional diversity in living costs. It is thus possible that the divergence in earnings, in real terms, is as great as before.

VI. CONCLUSIONS

(1) The skill differentials (for fitters and labourers) based on rates and earnings did not follow the same course in pre-war years—that on rates was generally narrower than that on earnings. However, the skill differential based on earnings has narrowed considerably, so that both now stand at about the same level. There were also a number of skilled occupations whose earnings showed a considerable differential above those of the ' representative ' category of fitters.

(2) Average earnings were naturally higher than rates, and this divergence increased over the period. (In certain regions, earnings fell below rates in 1931 owing to short time.)

(3) P. by R. workers' earnings were on the average considerably higher than time-workers', though the difference, while varying considerably between occupations, has diminished—more for the skilled and the unskilled than for the semi-skilled.

(4) The percentage by which P. by R. earnings exceeded time rates in 1948 was much higher than the ' minimum piecework standard '; but the relationship between P. by R. workers' and time-workers' actual earnings was close to that between P. by R. ' rates ' and time rates.[1]

(5) The number of workers on P. by R. grew very much during the war, though it subsequently declined among skilled and unskilled workers—but continued to increase among the semi-skilled.

(6) P. by R. workers worked on the whole shorter hours than time-workers throughout; and the skilled worked shorter hours than the unskilled.

(7) The spread in average earnings between areas, while tending to narrow over time, is still about as wide as the skill differential. In 1948, earnings were highest in the South and Midlands, and decreased outwards and northwards from these areas.

(8) High or low average earnings in particular areas seemed to connote relatively high or low earnings for all occupations and types of work in the industry, rather than the existence of special circumstances for workers of particular types or occupations—and to be associated with the prevailing branch of engineering.

(9) The changing pattern of average earnings in the various areas does not seem to be an adequate basis on which to generalise very far about the possible connection between relative levels of earnings, relative levels of unemployment, and the extent of labour mobility. Possibly however the order of relative average earnings is altered most by an increase in the prosperity of particular branches of the industry, and such levelling-up between areas as has occurred since the war has been occasioned by a more uniform level of industrial activity.

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[1] It has yet to be determined how far the extent to which P. by R. increases output is reflected in the higher earnings of P. by R. workers. While it appears from existing studies that P. by R. systems can certainly have the effect of increasing output in some trades, an adequate quantitative study for the engineering industry would have to take account of numerous different P. by R. systems operating in different branches of the industry.

APPENDIX

A. COMPARISON WITH MINISTRY OF LABOUR'S FIGURES

Figures from the Ministry of Labour's Earnings and Hours Enquiries for Oct. 1947 and April 1948 may be compared with our figures for Jan. 1948.

Ministry of Labour: Figures of Average Earnings and Hours, and Estimates of Hourly Earnings, 1947–1948 (Adult Males)

Industry group	Average earnings (shillings)		Average hours		Average hourly earnings (shillings)	
	Oct. 1947	April 1948	Oct. 1947	April 1948	Oct. 1947	April 1948
All industries covered by M. of L. Enquiries	128.1	134.0	46.6	46.5	2.75	2.88
Metal, engineering, and shipbuilding only	140.3	143.9	46.0	46.3	3.05	3.11
Engineering only	139.6	142.1	45.7	45.9	3.06	3.10
Engineering (excluding motor vehicle section)	135.8	137.7	46.3	46.3	2.94	2.97
Figures used in this article (*Jan., 1948*)	*139.6*		*45.6*		*3.07*	

Note.—The figures for 'all industries' and for the 'metal, engineering, and shipbuilding' group were taken straight from the *Gazette*, and are averages calculated by applying total numbers of men employed in each industry to the average earnings and hours of the men covered by the returns received for that industry. The figures for the 'engineering' and 'engineering, excluding motors' groups are averages calculated by weighting the figures for the separate sections of the groups by the numbers of adult males included in the returns for the sections. The 'figures used in this article' are those given in Table XII. The 'engineering only' group includes (*a*) general engineering and engineers' iron and steel founding; (*b*) electrical engineering; (*c*) marine engineering; (*d*) constructional engineering; (*e*) motor vehicle, cycle, and aircraft (including components) manufacture and repair. The figures for this group are based on data from both Federated and non-Federated firms.

Our figure of average weekly earnings is above the Ministry's figures for 'engineering, excluding motors', but our figure includes some data for motor and aircraft firms. It is below the Ministry's figures for 'metal, engineering, and shipbuilding'; but metal and shipbuilding—where earnings were higher, according to the Ministry—do not play a large part in our figure. It is however very close to the Ministry's figures for 'engineering only' (and is in fact identical with that for October). Our figure of hourly earnings is slightly higher than the Ministry's figure for October; and indeed hours were slightly shorter according to our data.[1] In general we conclude that the correspondence between our figures and those of the Ministry is good.

B. SOURCES

Engineering and Allied Employers' National Federation

1. Material submitted in response to a wage claim of the Confederation of Shipbuilding and Engineering Unions in 1940. This consists of a table giving, for 6 years before the war, average earnings and hours of adult males for 3 grades of skill.

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[1] Comparison with the Ministry's estimates of hourly earnings should not however be stressed, since these have been obtained by dividing average weekly earnings by average weekly hours for whole sections of industry, rather than by calculating weighted averages of hourly earnings for each return received.

2. Material submitted to a Court of Inquiry in response to a Confederation wage claim in 1948. This refers to the pay week including January 30th, 1948, and shows, for 48 regions, average earnings and hours of time-workers and P. by R. workers in 9 occupational categories. The regions are those of the employers' associations comprising the National Federation.
3. Material prepared by the Federation. This refers to October 1926, 1928,[1] and 1931; July 1938 and 1942; and January 1948. It shows, for 51 regions, average earnings and hours of adult male time-workers and P. and R. workers in the categories of fitters, turners and machinemen rated below fitters' rate, and labourers. (Data for turners and machinemen not available before 1938).

It is not possible to say precisely how far Federation material is representative of the engineering industry as generally understood. Not all categories of workers are included in the samples, but the categories selected are taken to be representative of skill gradations; and by 1948 there were over 400,000 workers covered (though fewer in earlier years). The Federation appears to include some 4,000 firms,[2] the vast bulk of production engineering—and in 1948 about 90 per cent of Federated firms made returns.

Confederation of Shipbuilding and Engineering Unions

4. Handbook of National Agreements, 1949.

Ministry of Labour

5. Time Rates of Wages and Hours of Labour, September 1947.

C. Tables and Maps

Table I

Rates (' old basis ') were modal values of recognised time rates in regional centres. (Source 5: rates were still applicable at January 30th, 1948). Rates (' new basis ') were time rates for the same regions[3] as in the earnings data (Source 2), weighted according to the numbers of workers given for each region. (Appropriate rates from Source 5). Earnings figures were weighted averages from the regional[4] figures (Source 2).

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[1] Figures for labourers refer to March.

[2] Excluding, for instance, factories making such products as nuts, screws, and bolts; motor garages; a few large motor firms; and, of course, Royal Ordnance Factories.

[3] The 48 regions were named as follows: Aberdeen, Barrow, Bedfordshire, Belfast Marine, Birkenhead, Birmingham, Blackburn, Bolton, Border Counties, Bradford, Burnley, Burton, Cambridge, Chester, Coventry, Derby, Dublin, Dundee, East Anglian, Halifax, Heavy Woollen, Huddersfield, Hull, Keighley, Kilmarnock, Leeds, Leicester, Lincoln, Liverpool, London Area, London (outside), Manchester, North-East Coast, Northern Ireland, North Staffs, North-West, Nottingham, Oldham, Peterborough, Preston, Rochdale, St. Helens, Sheffield, Shropshire, South Wales, Wakefield, West of England, Wigan. In the calculations, however, Cambridge was excluded because the data were usually deficient, and Dublin because it is outside the United Kingdom. Thus only 46 regions were used.

[4] *Cf.* notes on Table IV.

Tables II and III

Rates for 1948 are on ‘ old basis ’; those for earlier years are derived from the 1948 figures corrected by the deduction of agreed national additions at various dates (Source 4). Earnings from 1926 to 1931, and from 1938 to 1948, are from Source 3; these are drawn up for 51 regions which eventually conform to those of Source 2. (Occupational weighted averages of earnings are here given for all regions for which information was available at each date). Earnings from 1934 to 1939 are from Source 1, and are scaled to those from Source 3 by equating the figures for 1938. (This was necessary since the categories of ‘skilled’ and ‘ semi-skilled’ appear to be slightly different in the two sources; figures treated in this way are given in brackets.)

Table IV

Source 2. The figure for ‘ all above workers ’ is an average of the earnings of the 9 occupational categories, weighted by the numbers in each in our data. Figures of average earnings in each occupation are weighted averages of regional earnings. (In some occupations the earnings figures are deficient either for time-workers or for P. by R. workers in a few regions; and where this occurs we have neglected the regions in question.[1] This has had to be done in all other tables where this occupational classification is used).

Table V

Source 2. Method of calculation as for Table IV. (Numbers of time-workers and of P. by R. workers are for the same regions as in Table IV; thus the totals are slightly lower than those of Table XII.)

Table VI

See text.

Tables VII, VIII and XI

Source 3.

Table IX

Source 2. Method of calculation as for Table IV. ‘Average overtime ’ is taken from average hours—assuming the 44-hour week which came into force on January 6th, 1947 (Source 4).

Table X

Source 2. ‘Average hourly earnings ’ for both time-workers and P. by R. workers were found for each occupation in each region by dividing average (weekly) earnings by average hours worked. Occupational ‘ hourly earnings ’ are weighted averages of regional figures.

[1] For occupations Nos. 5, 6 and 8, all 46 regions were considered ; for No. 3, 43 regions (excluding Birkenhead, Chester, and Peterborough) ; for No. 9, 43 (excluding Aberdeen, Peterborough, and Wigan) ; for No. 4, 42 (excluding Belfast, Chester, Coventry and Northern Ireland) ; for No. 2, 38 (excluding Aberdeen, Belfast, Birkenhead, Kilmarnock, North Staffs., Peterborough, St. Helens, and Shropshire) ; for No. 7, 37 (excluding Aberdeen, Burnley, Burton, Chester, Coventry, Hull, Keighley, Oldham, and Rochdale) ; for No. 1, 35 (excluding Aberdeen, Barrow, Birkenhead, Border Counties, Derby, Hull, Kilmarnock, N. Staffs., St. Helens, Wakefield and Wigan).

Table XII and Map 1

Source 2. (Map 1 is based on 3rd column of Table XII). For each region, weighted averages of weekly earnings, hours, and ' hourly earnings ' were obtained for all occupations taken together. This was done for time-workers, for P. by R. workers, and for both. The 46 regions were grouped and weighted appropriately to give the 12 area figures. The composition of the areas was : *Western Area*, West of England, South Wales; *Southern Area*, London (outside); *London*, London; *West Midlands*, Birmingham, Burton, Coventry, North Staffs., Shropshire; *East Midlands*, Derby, Leicester, Nottingham, Sheffield; *Eastern Area*, Bedfordshire, East Anglia, Lincoln, Peterborough; *Lancs. and Cheshire*, Birkenhead, Blackburn, Bolton, Burnley, Chester, Liverpool, Manchester, Oldham, Preston, Rochdale, St. Helens, Wigan; *Yorkshire*, Bradford, Halifax, Heavy Woollen, Huddersfield, Hull, Keighley, Leeds, Wakefield; *North-West Coast*, Barrow, Border Counties; *North-East Coast*, North-East Coast; *Scotland*, Aberdeen, Dundee, Kilmarnock, North-West; *Northern Ireland*, Belfast Marine, Northern Ireland.

The division into areas in Map 1, while mainly conventional and determined by industrial homogeneity, has been affected by the boundaries of the regional associations. *Western Area* includes Wilts, Gloucester, and Hereford; and although most of Wales is shown, the data relate to South Wales only. *Southern Area* includes Dorset in the west, Oxford and Bucks. in the north, and extends to Southend along the north side of the Thames. *East Midlands* includes the Sheffield area of Yorkshire as far north as Doncaster and Barnsley. *Eastern Area* includes the northern portion of Essex, Bedfordshire, and the Soke of Peterborough. *Lancs. and Cheshire* includes towns on the northern coastline of Wales as far as Bangor, together with Anglesey. *North-West Coast* includes the Furness Peninsula. *North-East Coast* includes the Middlesbrough area of Yorkshire.

Table XIII

Source 2. Figures of earnings, hours, and ' hourly earnings ' are weighted averages based on those regions where it was felt that one particular type of engineering predominated. There were 8 regions for marine engineering, 10 for textile, 3 for motor and cycle, and 2 for agricultural engineering. The remaining 23 regions could be classified only as ' general or mixed '.

Table XIV and Map 2

Source 3. Figures are weighted averages for the same areas as in Table XII, but for fitters and labourers only. (Map 2 is based on these figures). For a few regions data were not always available in earlier years; in particular, no data existed for South Wales before 1942.